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1. $\mathcal{P} \in \mathcal{P}_n$ is a $n \times n$ matrix.
 2. $\mathcal{P}^T = \mathcal{P}$.
 3. $\mathcal{P} \geq 0$.
 4. $\mathcal{P} \mathbf{1} = \mathbf{1}$.
 5. \mathcal{P} is irreducible.

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